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TRANSLATIONS.

EHRlich's NEW ANTISYPHILITIC REMEDY.*

On the 22d of this month the Berlin Medical Society had again one of its "big days." The paper by W. Wechsellmann on the treatment of syphilis with the new arsenium preparation of Ehrlich (dioxy-diamido-arsenobenzol, at present called No. 606 in short) was the cause that the hall of the Langenbeck House was filled to the last seat. Although previously to this, by scientific articles and papers, something of this new remedy had become known, at this occasion for the first time every success that had been reached was to be heard and to be seen. And this meant much. For not only did Wechsellmann report on his extensive experiments on individuals with external syphilis, Alt had, also, come from Uechtspringe to give an extract of his astonishing successes in postsyphilitic nervous affections (tabes and paralysis). Furthermore, Schreiber from Magdeburg, L. Michaelis from Berlin, and Kromeyer and Tomaczewski completed the reports of the first two gentlemen by their own experiences. Every one of them had to report such excellent results with the new remedy in spite of their conservatism and critical discernment, that when finally Ehrlich himself arose to speak the recognition and gratefulness of the assembly was shown by a spontaneous and hearty applause.

We shall bring the paper and the official minutes in our next number, but think that we should immediately give a résumé of the transactions to our readers.

As is known, after the bad experiences with atoxyl against syphilis (atrophy of the optic nerve), Ehrlich had had experiments made with an improved arsenium preparation (arsacetin);

*We hope to interest our readers by the translation of this most important notice from the Berl. Klin. Wochenschr., June 27th, 1910.

yet, the bad results were the same, although somewhat rarer, than with atoxyl. Then Ehrlich, considering the chemical constitution and the effect to be expected, tried to find an innocuous remedy, and out of many hundreds of preparations which he tried, he and his collaborer Hata found the new product which in experiments on animals perfectly cured spirillosis in doses which were only the hundredth part of a toxic dose. After this fact had been confirmed beyond all doubt, the remedy was given to Alt, the chief of the insane asylum at Uechtsprunge, to try it on man, as he had done formerly with arsacetin. Carefully, as Ehrlich said for him, the inventor, almost too carefully, Alt, continually watching the metabolism and surrounding himself with all the possible safeguards, passed on from small doses to therapeutically active ones and could now announce it as his judgment that in No. 606 we have a remedy which so far had shown no noxious influence, but had proven itself to be of eminent value, even in a number of cases of paralysis. In one such case he even had considered himself justified in returning the patient to his responsible position as a judge. Wechselmann, Schreiber and L. Michaelis, who then studied the remedy in ordinary syphilis, came uniformly to the conclusion that with this remedy in cases of syphilis which has withstood every, even the most arduous, therapy with the known antisyphilitic remedies, the symptoms *after one single injection* (0.6 is at present the dose) had disappeared *in a few days*. The time, they stated, is still too short to speak of cures and even now refractory case have to be counted with, yet in the 600 patients treated thus far never any disagreeable effect was noticed, aside from the sometimes quite severe pain at the site of the intramuscular injection. In one of the first cases of Wechselmann in which the eyes had not been examined before the injection, there had been an optic neuritis from other causes, as was afterwards seen from the case history, and this was healed either through or in spite of the injection. Whether it is better to make an intramuscular or an intravenous injection, the future must teach. We must not forget to mention that after the injection the Wassermann reaction became negative and has not become positive again in any of the cases.

Whatever may be the final judgment on this new result of Ehrlich's work, whether Ehrlich's ideal of a *therapia sterilisans magna* has become true, or whether we shall come nearer this aim only by modifications and improvements, one thing seems certain even to-day: That the finding of this new remedy means one of the greatest therapeutic progresses, which are recorded in the history of medicine.

OF OPHTHALMODIAPHANOSCOPY.¹
DIAGNOSIS OF INTRAOCULAR TUMORS BY MEANS

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Translated by Adolf Alt, M.D.

Experience teaches that, in cases without pronounced typical symptoms, even an experienced ophthalmologist cannot to this day be perfectly certain of his diagnosis in spite of making use of all the diagnostic means at our hand.

Of the different stages usually distinguished in the development of malignant intraocular tumors (stage of detachment or pushing inward of the retina, inflammatory glaucoma, perforation of the globe and metastases), the first one, that of the primary detachment of the retina demands above all our diagnostic interest on account of the possible radical cure by an early enucleation. And just at this period the diagnosis of a choroidal sarcoma, the chief representative of the intraocular tumors, may be so difficult, that a diagnostic error may not only be pardonable, but directly unavoidable.

For this first stage, the only one we intend to discuss here, the simple serous detachment of the retina is almost the only point in question. The ophthalmoscopic distinction between these two pictures may become difficult and eventually impossible when the tumor is hidden by such a detachment and thus invisible to the ophthalmoscope, when denser formations of connective tissue do not permit of the recognition of the color and bloodvessels of the tumor or interfere with the floating of a simple detachment, or, finally, when opacities in the refractive media render a satisfactory ophthalmoscopic examination impossible.

The condition of the intraocular tension is a very elusive diagnostic sign when trying to differentiate between a beginning tumor formation and a detachment. Of course, a continued considerably increased intraocular pressure, especially when combined with a shallow anterior chamber, must arouse the suspicion of a tumor. In the early stages, however, such an increase in pressure is usually absent, the intraocular pressure may be decidedly reduced, even with a considerably larger tumor, as I have found repeatedly with the Schiøtz^{2,3} tonometer. On the other

1. Berliner Klin. Wochenschr., No. 24, June 13th, 1910.

2. Zeitschrift fuer Augenhlk., July, 1910. Paper on Ophthalmodiaphanoskopie, Ophth. Gesellsch. March 10th, 1910.

3. Langenhan Beitr. Z. Ophthalmotonometrie. Zeitschr. f. Augenhlk. XXIII, 3, 1910.

hand in many cases of simple detachment the intraocular pressure is normal, in some decidedly increased. The condition of the intraocular pressure can, therefore, not be relied on for such a differential diagnosis. For the same reason pain cannot be used for the diagnosis in this first stage, since where there is no increase in pressure the pain is usually wanting too.

The possible diagnostic difficulties, which are here just touched upon, and the deleterious consequences of an incorrect diagnosis as regards the life of the patient, explain that ophthalmologists are laboring continually to find new and successful methods of examination.

It is to be pitied that some of the more recent diagnostic methods so highly praised on different sides, do not stand unbiased criticism when the question of a pathological formation near the posterior pole of the eye is under discussion. Schweigger's explorative puncture has the danger of local implantation relapses in the conjunctiva. The palpation of the scleral capsule with a probe as recommended by Schmidt-Rimpler (increased resistency at the part suspected of a tumor) yields quite satisfactory results in cases of large tumors in the anterior part of the eyeball, is useless, however, when the tumor is situated in the posterior parts of the bulbus. Hirschberg and Grummach⁴ ten years ago reported a successful attempt to recognize an intraocular tumor by means of Roentgen rays, however, no other author has since confirmed their statement.

A distinct step in advance in such diagnosis has, however, been made by means of diaphanoscopy, the transillumination of the eye through the sclera. A transilluminator is held against the part where a tumor is suspected and throws a cone of light upon it. When the detachment of the retina is due to a tumor, there is no transillumination and the pupil remains dark; an exudation behind the retina, on the other hand, offers no optical obstacle to the cone of light and the pupil has a uniform red appearance. As excellent as the results of transillumination of the sclera are in the diagnosis of intraocular tumors of the anterior half of the globe, for the diagnosis of pathological formation situated near the posterior pole of the eye it is of no value, because the transilluminators can be applied to the æquator only or at most to a small area of the sclerotic lying behind it.

The failure or the limited usefulness of the methods mentioned have prompted me to experiment with a new procedure

4. *Centralb. f. Augenhlk.*, 1900, p. 336.

invented by Hertzell,⁵ *the diaphanoscopy of the fundus from the pharynx*, on our clinical material as to its usefulness in the diagnosis of intraocular tumors which were difficult to recognize and serous retinal detachment of the posterior part of the globe.

The ophthalmodiaphanoscope which Hertzell has lately described in this Journal consists in the main of a water-cooled electric metallic thread lamp of more than 80 normal candle power, the glowing threads of which are arranged so that the whole light comes out of the end of the lamp. The tube-like lamp which is put way back in the cavity of the mouth of the patient, produces such an intense transillumination of the walls of the orbit and the sclerotic that the pupils shine brightly and the observer can have a direct view of the interior of the eye without an ophthalmoscope and in very darkly pigmented individuals may even see some details of the fundus. A face mask of black material with two oval holes for the patient's eyes takes off the light which emanates from other parts of the face and interferes with the examination of the eyes.

As Hertzell emphasizes this method cannot take the place of an ophthalmoscopic examination since the character of the diaphanoscopic picture of the fundus is a totally different one. While in the ophthalmoscopic examination light thrown into the eye through the pupil is reflected by the fundus, with diaphanoscopy the light coming from the pharynx, that is, from behind, below and inward, reaches the fundus and, permeating it, the observer. He views it under similar optic conditions as we are accustomed at post mortems to examine the organs (intestinal wall) as to their transparency by holding them up to the light.

The diaphanoscopic picture is quite different from the ophthalmoscopic one. The whole fundus appears diffusely darkish red, the darker the more pigmented is the individual. The maximum of illumination corresponds with the position of the lamp down and inwards from the papilla. In order to illuminate the papilla intensely it will be well to let the patient look up and outwards. Its bright red color distinguishes it plainly from the darker neighboring parts of the fundus so that every one can easily at once recognize the disc. In consequence of the semitransparent condition of the nerve tissue it looks in general more opaque, its outlines are less sharp, the bloodvessels upon it are not distinct. The large veins, especially the trunks in the neighborhood of the papilla spring forth as sharply defined black-red strands, while the arteries are strangely indistinct. They appear like lighter

5. Berl. Klin. Wochenschr., 1908, No. 24—No. 47—1909, No. 42.

thin threads. In high-grade myopia the observer may not be able to see them. On account of the absence of reflexes the macular region can be easily inspected. Accumulations of pigment show well as black spots.

Since the fundus lies between the source of light and the observer, this method appears well adapted for judging the transparency of pathological fundus changes. We can a priori expect that all formations which are less transparent than the normal walls of the globe will be distinguished from the red of the fundus by a darker color.

Hertzell, already, based on these theoretical considerations, assumed that among other things this method might be applicable for the differential diagnosis between intraocular tumors and detachment of the retina, but he does not seem to have made diaphanosopic experiments with intraocular tumors. He reported on a case of detachment and one of retrobulbar tumor. In the first case the diseased and the healthy part of the fundus appeared a red of equal intensity, in the case of retrobulbar tumor the eye was hardly illuminated.

It remained, therefore, to prove the practical value of the method for the differential diagnosis by clinical observations. I have, therefore, examined a large number of patients with simple detachments and with detachment suspected of an intraocular tumor and believe, to anticipate here, based on the observations made that I must at least recommend farther trials with the transillumination from the pharynx as a help in making a differential diagnosis.

Results of transillumination in cases of serous detachment.—

While, as is well known, in the ophthalmoscopic picture a detached retina, on account of the light entering through the pupil, is distinguished from the red of the normal fundus by a grayish color, in the diaphanosopic picture especially with recent, uncomplicated detachments the whole fundus appears an almost uniform red. The tortuosity of the veins alone may prompt the diagnosis of detachment. At the site of deeper folds, sometimes at certain turns of the patient's eye, delicate gray lines may be seen which, on account of the floating of the detached retina, may be seen to change their position.

In older detachments with considerable newformation of connective tissue the diaphanosopic picture may show a grayish red color in the area of the detachment, but it is still transparent. The pupillary illumination of the diseased eye in such cases especially with extensive detachments and secondary changes in

the vitreous body may appear slightly reduced when compared with that of the other eye.

Results of transillumination in cases of intraocular tumors.—

In order to study the diaphanoscopy picture of a characteristic intraocular tumor at the posterior pole of the eye, the eye of a patient was transilluminated in which the ophthalmoscopic diagnosis of a roundish choroidal sarcoma lying close to the temporal margin of the papilla had been made; it measured about 5 to 6 papilla diameters and was about $2\frac{3}{4}$ mm. high at the most prominent place. Temporally from the tumor the retina was detached, as also in the lower parts of the fundus. With the diaphanoscope the solid tumor appeared as a deep black, well defined, round shadow in the otherwise red fundus. Outwardly from the shadow of the non-transilluminable body the red light could be seen unimpeded either by the detached retina near it, or by the one in the lower parts of the fundus. Microscopical examination revealed an almost pigment free spindle cell sarcoma of the choroid, which might be termed a leucosarcoma. This means that the diaphanoscopy shadow was not due to pigment, but to the solid consistency of the tumor.

While the diagnosis of this tumor had already been made ophthalmoscopically, and diaphanoscopy was employed only in order to see the typical diaphanoscopy picture of an undoubted intraocular tumor, the explanation of the ophthalmoscopic picture in two further cases presented difficulties which were removed only by the diaphanoscopy examination.

Thus, for instance, nothing definite could be made out as to differential diagnosis and therapy in the following ophthalmoscopic picture:

A partly flat, partly wrinkled detachment of the retina starting out and downwards from the papilla and reaching forward to the ora serrata, with newformation of connective tissue, which was of graywhite color near the papilla and towards the æquator a darker gray. $V=1(!)$. Diaphanoscopy showed a dense black shadow in the lower quadrant of the retina. This result prompted enucleation. Histological examination showed that this dark shadow was produced by a partly darkly pigmented choroidal sarcoma which reached its greatest height of $2\frac{1}{2}$ mm. in the lower æquatorial region.

As previously mentioned, the ophthalmoscopic diagnosis of an intraocular tumor may, also, be interfered with by opacities in the refractive media. They are of much less importance in the

diaphanoscopy examination, since—as Hertzell said—by the transilluminating light the fundus has become a source of light and the light emanating from it into the eye does not cause those reflexes by which we are so often hindered in an ophthalmoscopic examination. Although where there are dense opacities we cannot expect to recognize details in the fundus, an intraocular tumor may be detected with dense opacities in the lens or vitreous body by the shadow at the part of the fundus where it is situated.

This we found in a patient who came to the clinic because her right sight had been failing for six weeks. Diffuse and formed opacities in the vitreous body prevented a clear ophthalmoscopic picture which only aroused the suspicion of a large retinal detachment or a retinitis proliferans, especially in the upper nasal part of the fundus. At the diaphanoscopy examination a dark zone was seen at this place, which aroused the suspicion of a tumor, although the intraocular tension was decidedly reduced. The patient did not return for several weeks. She finally presented herself after a severe attack of glaucoma. In the night before the enucleation a spontaneous rupture of the eyeball occurred in the region of the upper inner corneoscleral margin. Histologically, an almost unpigmented round cell sarcoma of the choroid was found.

Another case shows that a melanosa sarcoma of the choroid can be detected by diaphanoscopy in its first beginning and when of extremely small dimensions.

The ophthalmoscopic diagnosis wavered between a tubercular nodule and a beginning tumor near the papilla, measuring about 2 papilla diameters horizontally and about $1\frac{1}{2}$ papilla diameters vertically—surely a rare differential diagnosis. Diaphanoscopy showed a uniformly inky shadow with sharp outlines at the site of the pathological newformation. The diagnosis of a melanosa sarcoma was thus established, especially since in two other cases recent tubercles of the choroid gave only delicate grayish red shadows.

Finally, I want to mention a case, which teaches that even tumors situated in the upper temporal part of the fundus, that is farthest from the source of light, produce distinct shadows when examined with diaphanoscopy.

The ophthalmoscope showed a roundish, nodular yellow red tumor of the size of a small cherry, protruding into the vitreous body in the temporal half of the globe, limited forwards and not quite reaching the ora serrata. It reached rather above the

horizontal meridian than below it; backward it reached to the macular. It was most prominent in the æquatorial region.

The diaphanoscope showed a large shadow which temporally from the macula became gradually darker. Its anterior limit could be made out definitely.

Although it is quite natural that the light cannot reach the temporal half of the eye, especially the outer upper part of the posterior capsule of the globe, with the same intensity, yet evidently the bright illumination of the whole orbital contents permits of judging, as to their transparency, of large pathological formations even in the temporal half of the fundus of the eye. The most favorable are, of course, the changes in the lower nasal part of the eyeball, because these are illuminated in the strongest and directest way.

As to whether smaller intraocular tumors in front of which the retina is detached bladder-like permit of seeing a distinct shadow, I have so far had no experience. I should, therefore, not yet consider the transillumination of the whole fundus in such a case as proof of the absence of a tumor.

The technique of transillumination.—It is well before employing diaphanoscopy, especially in older individuals inclined to miosis, to dilate the pupil with homatropin or cocaine to get as large and as bright a picture of the fundus as possible. If a tumor is found and there is fear of arousing a glaucomatous attack by the mydriasis, it is best to instill a few drops of a 1¼% solution of eserine into the eye after the examination. Artificial teeth plates must, of course, be removed.

Since the diaphanosopic picture of the fundus is decidedly less bright than the ophthalmoscopic one everything which can dazzle the eye of the observer must be removed. The room must be perfectly dark; the observer must absolutely avoid looking at a bright light, as for instance, the lamp of the diaphanoscope, just before examining the transilluminated fundus. It is best to adapt the eyes for a few minutes to the dark before turning on the current. If the face mask does not shut off all the light black cotton may be put under the margins of the openings for the eyes. Hertzell has made a modification of his lamp by means of which the returning of light from the patient's mouth is to be avoided, which he is soon to publish.

The time of transillumination must be as short as possible; although the water-cooling apparatus does away with the conduction of heat, during a prolonged transillumination the patient

has to suffer from the radiating heat. I, therefore, interrupt the current generally every $\frac{1}{2}$ to 1 minute.

The fundus can be viewed as well in the erect as, with a loupe, in the inverted image.

Not all individuals are equally favorable for such an examination. The brightness of the fundus varies very much according to the anatomical conditions (conditions of bones and cavities of the face, and especially the varying pigmentation of the background of the eye). Blondes are best for this examination. I have, however, transilluminated a larger number of darkly pigmented patients and found some difficulty in recognizing the disc and larger veins in very exceptional cases only. In such patients it is best to turn the tube in the mouth in such a way that the reflecting mirror does not look directly upwards, but directly towards the eye to be examined, that is to the right and up, or to the left and up. Even, if in such cases the fundus details cannot be recognized, I think I can assume that the deep shadow caused by an intraocular tumor would not escape detection.

Diaphanoscopy of the fundus of the eye is not of theoretical interest only, it merits, as I hope to have shown through this description, to be recognized as a new method of examination of practical clinical value. It is the only hitherto known method which in vivo permits of judging the transparency of normal and pathological formations in the fundus of the eye. Diaphanoscopy is to aid ophthalmoscopy. By itself it can only determine whether a formation in the fundus is perfectly transparent, or less, or not transparent. The decision as to whether this lack of transparency of a pathological focus is due to a tumor, a hæmorrhage, a pigimentary nævus, etc., remains with the ophthalmoscope.

The application of the method is limited in thus far, as the large diameter of the tube does not permit the examination of small children, and a deep introduction of the lamp in sensitive patients may cause retching, so that the mouth and pharynx must be anæsthetized with cocain. The method fails with very dense opacities in the refractive media, especially with large corneal leucomata and extensive hæmorrhages in the vitreous body. Thus we cannot expect it to influence favorably the differential diagnoses between hæmorrhagic glaucoma with or without an intraocular tumor. According to my experience gained thus far the method is especially useful for the early diagnosis of intraocular tumors of the posterior half of the globe and especially for the differential diagnosis between tumors and simple serous detachment of the retina.

BILATERAL MUCOCELE OF THE FRONTAL SINUS.*

BY DR. H. TRUC AND DR. P. LEMOINE.

Translated by Adolf Alt, M.D.

For a long time neglected by the authors, the study of the mucocoele or cystic dilatation of the frontal sinus is of comparatively recent date, since the theses of Garreau and Bertheux (Paris, 1881) were the first ones on this question. In the years following some few observations were published, especially by foreigners. A new general study of the subject we find in the thesis of Boël (Lyons, 1896) inspired by Rollet. Then the memoirs of Batut, Valude, Rollet, Luc, the thesis of Demaldent (Paris, 1900) drew the attention of the specialists to this curious affection. The observations then became more numerous. De Vincentiis, Marini, Calderaro, Casali, Axenfeld, etc., in foreign countries, and Rollet in France, published new cases. Since the thesis of Garreau and Bertheux about 40 cases have been observed.

Although the symptoms, the development and the treatment of mucocoele of the frontal sinus are well known, there are still some dark points. The further researches which these invite, coupled with the scarcity of this affection, have prompted us to publish a case, interesting on account of the voluminous dimensions of the cystic tumor and the eye troubles caused by it.

S. G., housekeeper, 64 years old, came to the ophthalmological clinic on November 11th, 1909, on account of loss of vision in the left eye.

The hereditary history gives nothing in particular. She herself has "always been well". Yet, at 5 years of age she had a keratitis, at 21 years she lost her hair, had bilateral chronic adenitis, and frequent pains in the right scapulo-humeral joint. Married at 30 years she had 6 children, one was still-born and two died at an early age. The remaining three are well. She denies syphilis and has no congenital malformation; she is not subject to coryza and never had a muco-purulent discharge from the nose.

About 8 years ago, without the least previous traumatism, as far as she can remember, the patient felt a sensation of heaviness and interference with the motility in the left eye; from time to time she had infraorbital pains of short duration. Six or seven months after the beginning of these first symptoms, she noticed, as she says, that "this eye grew larger." In the years following

*Revue générale d'Ophtalmologie, No. 5, May, 1910.

this exophthalmus increased progressively, without severe pain and without inflammatory symptoms. Finally the eyeball the motility of which had remained normal for a long time showed a divergent strabismus. The patient now complained of diplopia and loss of vision in the left eye.

In 1907, six years after the beginning of the affection, she noticed in the region of the left eyebrow a swelling which grew from day to day while the eye was forced forward and downwards. The sensations of general restriction of the eye and of pain disappeared at that time altogether.

When entering the hospital the patient attracted attention by the difformity of her face. At the level of the left superciliary arch a voluminous egg-shaped tumor protruded about 3 centim. from the forehead. It extended 3 centim. above and 2 centim. below the arch, covering the orbital margin altogether. The skin over it was of normal appearance and movable. The tumor adhering to the bone was tense and in its middle portion decidedly fluctuating. Downwards and backwards it was lost in the orbit; upwards by a rather sharp declivity it was connected with the frontal bone; outwards and inwards its extremities ended at a veritable bony wall. It seemed as if where the tumor started the bone had been blown up and formed a bubble with a large loss of substance in its centre and in its lower portion. There is no difformity at the root of the nose; pressure is not painful and auscultation can detect no noise.

The eyeball is very much protruded and turned down- and outwards. It is about 2 centim. lower than the right. Its motility is much reduced and the closure of the lids is incomplete. There is ptosis, abundant lacrimation, conjunctival hyperæmia and a slight diffuse leucoma. The pupil is regular, reacts but feebly to light and accommodation. The ophthalmoscope shows a pale fundus and a decolored papilla with sharp edge, thin arteries and slightly enlarged veins. V. R.E.=0.4, with—1,5=0,7; V. L.E.=4/50.

The visual field is contracted. There is no scotoma. The color sense is reduced, blue is seen as green. There are no cerebral or psychical symptoms. The right side appears normal.

These symptoms suggest a cystic formation without giving an explanation of its origin and nature. An operation was decided on.

About $\frac{1}{2}$ centim. from the left orbital rim a semicircular incision was made reaching from the end of the eyebrow to the root of the nose. Under the skin and the cellular tissue through

an opening in the anterior wall of the frontal sinus the tumor appears in the form of a cystic mass protruding between the everted rims of the opening in the bone. Since it was impossible to enucleate the pathological formation as a whole, it was emptied through an incision by which a thick, viscous substance flowed out of a brownish green color something like bile. After the anterior wall of the cystic membrane had been removed and put aside for histological examination, the walls of the frontal sinus were explored. Its floor had entirely disappeared and the tumor rested directly on the orbital tissue.

Backwards the internal table, partly destroyed, showed the dura mater in a space of a 5 franc piece, in which the pulsations of the brain were visible and could be palpated. In front, as stated, was the opening in the bone shaped like an inverted V, its rims turned outwards by the force of the mucocoele. Outwards the borders of the sinus were normal, inwards the septum between the 2 sinuses had disappeared and there was a large communication with the ethmoid cells.

With gouge and a hammer the anterior wall was removed in order to permit of an agglutination of the skin to the posterior wall; moreover, since there was some osteitis all diseased parts were resected and in this manner the right frontal sinus was opened, which was, also, filled with a yellow brown substance resembling in consistency to that of the cystic tumor. The cavity of the right frontal sinus was not enlarged. The sinuses were wiped out, curetted and irrigated. Since no drainage could be procured into the nose, as both fronto-nasal passages were closed completely, the wound was closed and two drains were put into the lower parts. The consequences of the operation lasted long but were normal. Cicatrization took place quite rapidly. One month after the operation, the eyeball had become raised and was only $\frac{1}{2}$ centim. below the right one; the exophthalmus was much reduced, the eye was almost in the normal plane. The motility of the eyeball and the visual acuity have to this day shown no improvement. The deep healing has gradually taken place and a drain was employed until the end of March.

Microscopic examination.—The search for micro-organisms was entirely negative. From the point of cytology the direct examination of the mucus revealed the presence of a considerable number of leukocytes surrounded by an amorphous material and of some big ragged elements which seemed to be formed from agglomerated cell debris. All these elements have a yellow greenish color which probably gave the fluid its peculiar color.

There are also beautiful crystals of cholesterin. With hæmatin-eosin staining the leukocytes are found to be almost altogether altered lymphocytes. They take the stain badly. The background of the specimens consists of an amorphous substance and cell débris coming probably from the large elements just mentioned. No erythrocytes are found.

Chemical analysis.—The chemical analysis was made by Mr. Mestrezat* and gave the following result:

Water	798
Dry residue at 100.....	202
Ashes	26.9
Iron	0.103
Cholesterin	present
Pigments.	

The coloring matter is soluble in alcohol, chloroform, ether and even water. A concentrated alcoholic solution gives the color of a green bottle and has the chemical and spectroscopic characteristics of bilirubin and biliverdin.

Anatomico-pathological examination, made by the kindness of Professor Viellaton, gives the following results: A part of the membrane was fixed in Zenker's solution, the other in Flemming's. The sections were partly stained with hæmatin-eosin, partly with polychrome methyl blue.

There is nowhere an epithelial coat. It is probable that the parts removed represented only a portion of the wall. There are bands of normal connective tissue, almost lardaceous, containing thicker and thinner fibrous layers separated by islets of fat tissue. Bloodvessels are very numerous; the muscular walls of the arterioles are greatly hypertrophied and in several places there are slight hæmorrhages.

What is, however, surprising is a lymphoid infiltration sufficient to form a distinct layer which here and there contains true lymph follicles. To sum up, we have to deal with a tissue composed of normal elements which are displaced and have been pulled along by the growth of the cyst.

The studies which Rollet gave to frontal sinus mucocoele in the French Encyclopedia of Ophthalmology, relieves us of devoting much time to this subject. We only want to try to bring out some peculiarities of our own observation.

There is first the advanced age of our patient. Since the af-

*Comptes rendues, Soc. biolog., 1910.

fection is usually one of adolescence or the middle age of life, so that we may think that it might have some connection with the development of the sinus, in our case the patient was 64 years old. We find 4 times only (Young, Luc, Silcock and Valude) that the mucocoele was observed after the 45th year.

Certain observers have seen the origin of the frontal sinus mucocoele in a previous injury to the orbital region; but the long time which usually elapses between the appearance of the first symptoms (15 years with Garreau's patient, 20 years with Silcock's), the number of cases in which an injury has been wanting, permit us to neglect the ætiological importance of this factor.

Sinusitis, acute or chronic coryza, are also found rarely; 4 times only (Mei, Silcock, Valude, Watson) a purulent or mucopurulent discharge from the nose was found. Infectious diseases are still more rare, since we find only facial erysipelas twice (Garreau, Watson). In our case as in most of those we have been able to look over, no constant and certain aetiological factor could be established.

The affection is almost always unilateral. Rollet and Valude have each published a case in which it was bilateral. In our case the septum between the sinuses had disappeared, and although the tumor was encysted, we found the right sinus filled with a colloidal substance. This was a mucocoele in beginning and without the operation we would probably have seen a gradual dilatation of the cavity of the right frontal sinus.

This distention always takes place at the expense of the roof of the orbit, since of all the walls of the sinus the floor is the thinnest, especially in its anterior and inner part. Zuckerkandl has here even described some true interruptions of continuity, and it is here at this weak point that the tumor naturally begins to protrude, having eaten away the bone by compression. In fact, in the beginning of the affection there is almost always a swelling found at the orbital margin, especially at the inner canthus. Rarely, as in our observation, the tumor appears first in the middle of the orbital arch. The cause for this abnormal behavior lies probably in such preformed perforation of the floor of the sinus, as Zuckerkandl has described.

However this may be, the swelling of the orbital margin and the exophthalmus due to the invasion of the orbit, are the two first signs of a frontal sinus mucocoele. Very much later (in our case 6 years) the anterior wall gives way and is perforated. As one of the cardinal symptoms of this affection Rollet has mentioned the naso-orbital hyperostosis. This curious difformity

of the root of the nose, very pronounced in the case reported by this author and in those of Valude, Batut, and Langenbeck, is not mentioned in many observations and was totally wanting in our patient. It seems to us that Rollet's sign has been wanting in all cases of mucocoele growing in the centre or externally.

The tumor grows usually in a slow and insidious manner, without altering the skin and without severe pain. In exceptional cases it may assume an acute course (Demaldent's case). The cyst grows step by step when not interfered with and can acquire an enormous size and grow out of the sinus on all sides.

In such cases naturally grave complications must result. The first disorders concern the eye. The penetration of the cystic growth into the orbit causes the eye to protrude and to be pressed more or less downwards (2 centim. in our case). The nutrition of the eye is interfered with, which causes grave visual troubles. Thus our patient had, besides lacrimation and conjunctival hyperæmia, a decided atrophy of the optic nerve. In old and voluminous mucocoeles (Young, Luc) even a partial destruction of the posterior wall of the sinus has been found, just as in our case in which the dura mater was laid bare. We must, therefore, in such cases be particularly afraid of the possibility of an infection changing the mucocoele into an empyema, especially on account of the proximity of the brain, which is protected only by the thin meningeal membranes.

In some rare cases (Spencer-Watson, Boissarie) the development was of a more benign nature and a cure came about by the spontaneous evacuation of the fluid into the nose. But, such a termination presupposes necessarily a permeability of the fronto-nasal passage. In the majority of the observations, as, also, in our own, all communication between the frontal sinus and the nose was cut off on both sides.

This fronto-nasal obstruction is explained in very different ways by the different authors.

Luc and Valude see in it the beginning of the mucocoele. They assume that a hypertrophic osteitis closes the lumen of the excretory canal of the frontal sinus and thus causes a dilatation through retention and accumulation of the products of secretion. If we add, as Kuhnt proposes, to this hyperostosis a congenital malformation of the canal, the predilection of the mucocoele for adolescence is explained.

Rollet, Demaldent, and Lapersonne, on the contrary, assume a primary inflammation of the mucous membrane of the frontal sinus, or the canal; the obstruction of the canal would occur

secondarily and in consequence of a periostosis due to the inflammation of the mucous membrane. Without wanting to attribute to the frontal sinus mucocoele a unique pathogenesis, we rather, from the peculiarities of our case, lean towards the hypothesis of an attenuated infection of the mucous membrane and this in spite of the absence of micro-organisms in the contents of the cyst and of a sinusitis (at least according to the patient's statement). First, a number of cases of mucocoele have been observed in which there existed a more or less complete permeability of the excretory canal; then, the hypothesis of a hypertrophic osteitis in connection with the development of the sinuses can hardly be maintained in patients who are more than 40 years old.

Finally, the enormous quantity of leukocytes found in the contents of the sac, the leukocytic infiltration of the cystic membrane and the existence of true lymph follicles within it, cannot be explained except by the presence of an infectious process. We only recall here the theory of Garreau and Bertheux, who assume as starting point of this affection a retention cyst due to the obliteration of the excretory duct of a gland in the mucous membrane.

The contents of the mucocoeles appeared different in the different cases, still they had always certain almost typical characteristics in common. The contents are never purulent, they are thick, gelatinous and often contain a large number of hæmorrhages or leukocytes; they contain droplets of fat and crystals of cholesterin. On the other hand, the color varies considerably and reaches from opalescent clear to greenish black (Young, Silcock), with rose, yellow and red (Boissairic) as intermediate stages. The color seems to depend on the number of hæmorrhages which are or have been present. It must be regretted that we do not possess the complete examination of all the fluids, because we might have found out whether the dark pigments are seen when red blood cells are destroyed. In our case, although the membrane of the cyst was very richly vascularized, we have found no erythrocytes, but the chemical examination showed bilirubin and biliverdin. It is probable, that this is a transformation of hæmoglobin into biliary pigments, a veritable local hæmolytic biligenesis, to which Mr. Mestrezat* has drawn our attention. The analogy between our case and those of Young and Silcock permits us to suppose a similar mechanism in their cases. The abnormal vascularity of the cyst membrane, the almost constant presence of a great number of hæmorrhages or,

*Mestrezat Biligénie hémolytique local dans un cas de mucocèle Comptes rendues, Soc. biolog., 1910.

instead, of pigments which in accordance with our case we may consider as formed of bilirubin and biliverdin, show plainly the hæmorrhagic tendency of such mucous cysts.

We shall not speak of the diagnosis of mucocele, this is easily made on account of its particular symptoms and the special characteristics of the fluid furnished by an explorative puncture. We only mention the possibility of confounding it with a meningocele, a hydatid or dermoid cyst, an osseous or vascular tumor of the orbit or the frontal sinus.

The treatment is of the simplest: The evacuation of the fluid by puncture is insufficient. We have to make a large opening into the sinus, and to resect the osseous tissue which overlaps the orbital arch, so as to allow of the skin to become agglutinated to the posterior wall. To this large opening we must add the destruction of the mucous membrane by curetting or cauterization with iodine, or chloride of zinc.

Should we open a communication between the sinus and the nose? We think it preferable, if the passage from the sinus is obliterated, not to establish any connection with the nasal fossa, an artificial opening might lead to suppuration, especially when the cavity is very large. Since in cases in which the contents of the cyst are colloid, there is not a trace of pus, we should be content to close the wound, putting two small drains in the lowest parts. With such a régime we guard against every complication and a possible relapse.

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ABSTRACTS FROM MEDICAL LITERATURE.

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A CLINICAL INVESTIGATION ON THE RELATION OF TUBERCULOSIS TO CERTAIN DISEASES OF THE EYE.

George S. Derby and Thos. H. Ayer (*Jr. A. M. A.*, May 28, 1910) submit a summary of their findings in the study of ninety-two cases where the ocular disease, from its clinical appearance, suggested a tuberculous origin. They divide their cases into two general groups, the first comprising those cases in which the ocular inflammation was superficial and the second those in which deeper structures of the eye were involved. In the first group were fourteen cases of phlyctenular conjunctivitis, the average age being $14\frac{1}{2}$ years, and fifty-two cases of the so-called phlyctenular keratitis (keratitis eczematosa, scrofulous keratitis) with an average age of $9\frac{1}{2}$ years. The twenty-six cases in the second group were made up of six cases of scleritis, six of interstitial keratitis, four of uveitis, seven of sclerokeratitis and three of keratoiritis, the average age being $26\frac{1}{3}$ years. The following tables are interesting:

GROUP I (SUPERFICIAL OCULAR INFLAMMATIONS) AND GROUP II (INFLAMMATIONS INVOLVING DEEPER STRUCTURES OF THE EYE)

FAMILY HISTORY

Group I:	66 cases.	Positive in 16, or 24.2%.
Group II:	26 cases.	Positive in 5, or 19.2%.
Whole series:	92 cases.	Positive in 21, or 22.8%.

TEMPERATURE

Group I:	66 cases.	Elevated in 26, or 39.3%.
Group II:	26 cases.	Elevated in 12, or 46.1%.
Whole series:	92 cases.	Elevated in 38, or 41.3%.

SUSPICIOUS SIGNS OF TUBERCULOSIS

(Lungs, glands, local reaction to subcutaneous test, etc.)

Group I:	66 cases.	Positive signs in 32, or 48.5%.
Group II:	26 cases.	Positive signs in 18, or 69 %.
Whole series:	92 cases.	Positive signs in 50, or 54.3%.

REACTION TO TUBERCULIN

Group I: 66 cases. Positive in 59, or 89.3%.
Group II: 26 cases. Positive in 24, or 92.3%.
Whole series: 92 cases. Positive in 85, or 90.2%.

The authors say: "We believe that for the good of the community, if not for the individuals themselves, these eye patients should be given a thorough physical examination as a routine procedure. We think it likely that the deep and severe tuberculous infection of the eye are often the first stage of a tuberculous infection acquired in childhood and manifested at that time in the form of a phylctenular process. It is important that the significance of these forms of ocular disease should be brought to the attention of the ophthalmologist and to the medical profession in general."

They believe the subcutaneous test with tuberculin should be used only in those cases where a diagnosis cannot be made otherwise and where a positive diagnosis is essential to intelligently treat the case, since it requires more hospital beds than can well be furnished in a large clinic and patients often refuse to give the time for such tests. Moreover, the moral effect of a positive reaction with severe general disturbance is often bad for the patient. The conjunctival test is also objectionable since it sometimes causes disastrous results. While a positive cutaneous test may be of little value in the diagnosis of ocular disease, a negative test is of great value as tuberculosis may be excluded where two negative tests are obtained. They have seen no harm follow the cutaneous test employed on nearly two hundred patients.

The authors believe that the best way to treat this class of patients is by means of the tuberculous class. A brief description of the way patients are treated in this way is given.

NEW THEORY OF THE ORIGIN OF PAPILLITIS
(CHOKED DISC).

Josef Windbiel (*N. Y. Med. Jr.*, March 26, 1910) writes briefly concerning Prof. Schieck's new theory of the cause of choked disc, "based on the pathological and anatomical examination of fresh bases of papillitis, in which the posterior bulb section, including the opticus, was examined through serial cuts or sections, thereby showing that the inflammatory theory (Leber-Deutschmann) cannot possibly be right." In every instance Schieck found a decided widening of the perivascular lymph

channels in the axial strand, which he clearly shows by a large number of photomicrographs. The serial sections also show a decided narrowing of the calibre of the central vein which was found of different width at certain places. This variation of the size of the lumen was especially shown in the longitudinal sections. It has been demonstrated that in the beginning of a papillitis the condition is one of œdema or saturation with stagnant lymph and that this œdema is confined to the axial strand. It is only in the later stages that inflammatory signs appear and these are caused by the resorption of the decomposed nerve material and also the stagnant lymph.

Schieck's theory of the origin of papillitis, according to Winbiel is as follows:

Gifford and Levinsohn have proved that the posterior vitreous lymph is led off in the perivascular lymph spaces of the central bloodvessels, in the axis strand. This fluid stream meets the one that flows away from the brain, down along the optical sheaths, at a point where the axial strand enters into the subarachnoid space together with the central bloodvessels. Both fluid streams are then led outward, through the perivascular sheaths of the central blood vessels, which pierce the dura from the intervaginal space. As soon as an increase of intracranial pressure produces even a slight increase in the fluid pressure in the subarachnoid space the vitreous lymph is prevented from leaving the axial strand. But this does not occur (as Levinsohn supposes) through the inflammatory influences of the pathologically modified cerebrospinal fluid from the cerebral disease, followed by a congestion of perivascular lymph spaces of the axial strand; but on the contrary purely physically through overpressure in the intervaginal space which makes impossible the outflow of lymph from the lymph channels into the space. The lymph which has been accumulating more and more in the axial strand leads to be a considerable enlargement of the perivascular spaces and finally to œdema of the axial strand. From here out the infiltration progresses with great rapidity over the whole cross section of the distal end of the optic nerve. At the same time through ectasia of the lymph spaces a mechanical compression of the bloodvessels in the axial strand results and finally an exfoliation of the intima due to pressure from the transudate between the coverings of the bloodvessels. Because of this, the lumen of the central bloodvessels are greatly diminished."

OCULAR SYMPTOMS IN EXOPHTHALMIC GOITER.

C. F. Heerfordt (*Ugeskrift for Læger*, Copenhagen, January 27, 1910) discusses the exophthalmos, symptoms on the part of the lids and ocular muscles, anomalies in the lacrimal apparatus, conjunctiva and cornea, and other affections liable to occur with the disease. The exophthalmos may be unilateral, and in many cases the protrusion of the eyeball is within physiologic limits. The movements of the eyes are not impaired with exophthalmic goiter as much as with other forms of exophthalmos. The eyelids may be sluggish in their movements, especially in regard to following the movement of the eyeball downward. The absence of normal involuntary winking is also an early symptom, the patient not winking for minutes at a time and then only in a rudimentary manner. These symptoms on the part of the eyelids may appear on one or both sides. Paresis of the ocular muscles is more characteristic than mere insufficiency of convergence. Ocular paresis may develop with other motor disturbances in the course of the disease. Epiphora is frequently encountered and usually early in the disease; it may accompany exacerbation of other symptoms. It may even be the first symptom that brings the patient to the physician. Later the patient may complain of dryness of the eyes and the lacrimal secretion may be found reduced. Hyperemia in the eyeball and conjunctiva is frequent in incipient exophthalmic goiter and may return frequently later. There is no evidence to show that the disease is directly responsible for the development of cataract, myopia, restriction of the visual field, glaucomatous conditions or atrophy of the optic nerve. Becker called attention to a peculiar characteristic pulsation in the centralis retinae artery, but no one seems to have confirmed his finding.—*Jr. A. M. A.*

INFANTILE GLAUCOMA OR BUPHTHALMIA.

W. Allport (*Brit. Med. Jr.*, March 5, 1910) reports the case of a child who, when first seen at the age of 6 months, was suffering with almost constant lacrimation. The intraocular tension was high, the cornea large and the globes somewhat prominent. On account of the intense photophobia no ophthalmoscopic examination could be made. Allport did an anterior sclerotomy on the left eye when the patient was three years old. The incision was made so as to cut entirely through the upper part of the interciliary region but the conjunctiva was not cut by

the knife as it emerged from the sclera, but was undermined for several millimeters, thus forming a bridge of tissue which held the corneal flap in position. The purpose of this operation was to form a scar that would act as a drain allowing the fluid to escape under the conjunctiva. This was obtained, as a small cystoid cicatrix formed, leaving a minute fistulous opening so that the tension soon became normal and the symptoms soon disappeared.

Later a similar operation was performed on the other eye and several months later the tension was normal in both eyes, the photophobia had ceased and the child had fairly good vision so that she could see a pin on the floor several yards distant. The color perception is good and the fields not greatly contracted. All symptoms have disappeared and the eyes appear practically normal.

PSYCHOSES ASSOCIATED WITH OCULAR AFFECTIONS.

Samuel D. Risley (*Penn. Med. Jr.*, February, 1910) reports a number of cases of psychoses, one a case of insanity, another of *petit mal*, and several of nervous exhaustion and suffering with severe pain and mental dread, all of which were relieved by the correction of their errors of refraction and muscular imbalance. While in each of his cases there existed an error of refraction, especial emphasis is placed upon the fact that there was a significant degree of difference between the amount of error in the two eyes and upon the muscular imbalance that was present in each case. In one case the correction of the ametropia gave little or no relief; but almost immediate and complete relief followed a tenotomy for the correction of a left hyperphoria of four degrees. The ocular defects found in these patients are those which are quite frequently found so that for the production of these psychoses another factor is essential, viz.: an unstable nervous system, either inherited or acquired. These three questions are asked: (1) How can eyestrain, primarily a muscular phenomenon, produce the psychologic symptom complex here recorded? (2) Why should constant tension upon a group of muscles innervated by the oculomotor disturb or confuse what Dr. Mills has designated the concrete or stereognostic mental concept formed in the higher visual areas? (3) How may we account for these hallucinations, this fear of impending evil, the confused, distorted or deranged mental concepts? Answers are

not given, but it is suggested "that exhaustion, irritation or, it may be, a variation in the blood supply of the cortex in and near the primary or lower visual areas would be sufficient cause for the symptom complex as noted, since it is conceivable that either a congestion or an anemia of the primary perception centers would modify the distribution of the visual perceptions to the higher visual areas. Having in view the still uncertain state of our knowledge regarding the oculomotor nucleus, its relation to the optic nerve, and its ramifications and distribution; and still more the vagueness of our understanding regarding the influence of the vasomotor nerves, as supplied to it through the ciliary ganglion, over the dilatation and constriction of the blood vessels, one does not feel disposed to indulge in dogmatic statements.

Certain it is, that when the tension upon the eyes was removed and rest secured, the symptoms disappeared.

A STUDY OF TRANSILLUMINATION.

Percy Freidenberg (*Jr. A. M. A.*, June 18, 1910) has examined a large number of eyes, normal and diseased, as also many enucleated globes, by transillumination, using both the Sachs and Würdemann lamps. The normal sclera always appears translucent, something like the web of the fingers when held up to bright light. The healthy cornea and lens transmit light perfectly, of course, while the iris and ciliary body appear quite opaque. The choroid contains too little pigments, normally, to affect the transmission of light to any great extent. In pathological conditions, ordinary opacities of the cornea, even when quite dense, and changes of the crystalline lens whether nuclear, polar, cortical or capsular, even mature senile cataracts transmit a bright glow. Thus old leucomata can easily be transilluminated, giving valuable information concerning the condition of the pupil. Dense pannus obscures the reflex somewhat owing to the blood in the new bloodvessels. Old, obliterated bloodvessels do not act thus. Deposits of uveal pigment on the cornea or capsule of the lens show distinctly by transillumination as do also blood clots in the vitreous or any part of the eye. Detached retina is transparent so that this condition can be easily differentiated from intraocular tumor by this method, while with the ophthalmoscope it is often difficult or impossible to do so. In the diagnosis of intraocular tumors the transilluminator is of most service. Melanosarcomata cast dense shadows and, in at least

one instance, Fridenberg was able to obtain a decided shadow from a deep-seated leucosarcoma of the chorioid. He believes the explanation of the shadow cast by the leucosarcoma is the irregular arrangement of the tissue cells. Glioma of the retina casts no shadow but bone or calcareous changes in the eye invariably shows an opacity. Fridenberg states that the circumlental space cannot be shown or indicated by transillumination. He gives reasons why this statement must be true. Since leucoma of the cornea do not interfere with transmission of light, information concerning the site of an optical iridectomy, or the advisability of tattooing a corneal leucoma, may be obtained by transillumination.

SOME OPHTHALMIC CONDITIONS CAUSED OR INFLUENCED BY DISEASES OF THE UPPER RESPIRATORY TRACT.

A. S. Cobbledick (*British Med. Jr.*, May, 28, 1910) says that in every obscure eye case, especially where there is complaint of a long standing nasal or postnasal catarrh, the accessory sinuses should be examined by an expert, and, if diseased, they should be radically treated for the benefit of the eye trouble. When operation on the eye is contemplated, not only should a careful examination be made of the condition of the conjunctiva, but the mouth and nose, with its diverticulum, the nasal duct and sac, should be examined. If pyorrhœa is present no operation should be entertained until the mouth is perfectly clean; even then the system may be so permeated with staphylococcic toxines as to render the likelihood of an endogenous eye inflammation possible as the result of the traumatism of operation. The same remarks apply to atrophic rhinitis and chronic sinusitis. The condition of the operator's mouth and nose must also be considered in this connection; carious teeth, pyorrhœa, or nasal trouble, including acute coryza, should be looked upon as a possible source of infection, and precautions taken; speaking during the operation should be forbidden for obvious reasons. The bacteriology of postoperative inflammatory eye troubles indicates that the pneumococcus and staphylococcus play an important part; these microorganisms are not frequently found in the conjunctival sac, but the mouth is a common habitat, hence the great likelihood of infection arising from the operator's or assistants' exhalations. Mention must be made of blindness resulting from the onset of optic atrophy, caused by intranasal operations. Such

cases are, of course, not frequent, but there are a number on record. Perhaps the most common accident has been entry of the orbit when exploring the antrum of Highmore with a trocar or cannula, or in forcibly boring a hole in the alveolus of the superior maxilla, for drainage purposes; loss of control and the absence of a stop on the drill has resulted in puncture of the floor of the orbit and either injury to the optic nerve or infection of the orbital contents. Forcible removal of bony nasal spurs and of the middle turbinal bone may produce a fracture involving the optic canal, the formation of callus, pressure of the callus on the nerve, and subsequent atrophy.—*N. Y. Med. Jr.*

RECOVERY OF VISION IN AN AMBLYOPIC EYE
AFTER FOUR AND A HALF YEARS OF BLIND-
NESS; A CONTRIBUTION TO THE QUESTION
OF AMBLYOPIA EXANOPSIA.

C. M. Harris (*Penn. Med. Jr.*, February, 1910) states that recent medical literature contains very little in opposition to the theory that in some cases vision becomes defective from non-use of the eye, while a number of observations, among them those of Worth, argue very strongly in favor of it. While he admits that congenital amblyopia seems to have been proved, yet he believes it is much rarer than some writers claim. Heine is quoted as having found that over ninety per cent. of such eyes have central scotomas with slightly greater pigmentation in the macular region and that improvement in the vision of such cases is rare. Worth claims that congenital cases have normal visual acuity to within five degrees of the fixation point and the fields for white and colors are full, and that in the acquired condition the blindness is more pronounced and in some cases large scotomas. He has found that in ordinary cases if the squinting eye is examined when the squint is first observed the vision is generally normal. Where it is not he assumes the trouble is congenital. Partial optic nerve atrophy from meningitis or convulsions in early childhood and retinal hæmorrhages in the macular region during birth doubtless cause defective vision in some eyes that are considered congenitally amblyopic. Congenital cataract may be a cause of amblyopia exanopsia which would suggest that operation should be done as early as consistent. Harris believes that it is wise to prescribe the proper correcting lens for an amblyopic eye in those cases where the amblyopia may be due to a high degree of astigmatism, even if the astig-

matism is in an oblique axis and if there is no improvement of vision at first. Accurate retinoscopy is of great assistance in selecting the correct lens in such cases. Reference is made to the instrument devised by Dr. A. A. Bradburne, of England, for developing the center for recognizing objects, which he assumes exists in addition to that for simply perception. In young subjects this may be of material assistance.

He reports the case of a boy whose right eye turned in markedly since he was three years of age. At the age of seven and one-half years the left eye was injured by the penetration of a small piece of steel into the globe. He saw the case five hours after the injury, when the vision of the injured left eye was shadows at two feet and of the right eye $2/45$. The steel was removed from the left eye on the second day, successfully, but the eye gradually degenerated with no prospects of any useful vision. Twenty days after the injury the vision of the right eye had improved to $5/45$. Retinoscopy under cycloplegia at this time showed 7.50 D. of hypermetropia. The vision was not improved above $5/45$ with this correction but a +6.50 D.S. lens was prescribed. One week later the vision was $5/30$. Ten weeks later it was $5/15+2$ with correction. In one year from the time of the accident the vision was $6/9+1$, and three months later it was $6/7.5$, while the injured eye saw shadows at three feet.

THE QUESTION OF ENUCLEATION IN PURULENT PANOPHTHALMITIS.

WITH A BRIEF EXPERIMENTAL STUDY OF THE SUBJECT.

Robert L. Randolph (*Jr. A. M. A.*, June 18, 1910) has undertaken some experimental work to determine if possible the amount of risk taken in enucleating eyes in which there was a purulent panophthalmitis present. Having produced an acute panophthalmitis in a number of rabbits and guinea-pigs' eyes (43 in all) he enucleated the eyes at the height of the inflammations. One of the rabbits died at the end of two weeks after the operation, but there were no evidences of meningitis or any involvement of the brain. Another rabbit died from the effects of an injury five weeks after the enucleation, having suffered no ill effect from the operation. In the others the experiment was negative. He says: "The results of these experiments tally precisely with what happens in human beings under similar circumstances, and they help to impress us with the fact that death from meningitis induced by enucleating an eye in the acute stage of

a purulent panophthalmitis is an exceptional event. That the infection travels by one or more of several routes (i.e., by the lymph and blood passages, the sheaths of the optic nerve) is probable." He finds that, according to Becker, forty-three cases of meningitis following enucleation of an eye were on record up to 1888. Very little on the subject is to be found in the literature in this country. Among foreign surgeons, Panas, Dufur, Motais, Gayet, Brudenell Carter, Mr. McHardy, and Mr. Gunn have favored enucleation under such circumstances, while Meyer, Galezowski, Abadie, Nettleship, Higgins, and Mules have opposed it. In spite of his experimental findings and statistical evidence on the subject Randolph believes that incisions in the eyeball is a safer measure than enucleation in these cases and would advise enucleation only in exceptional cases.

THE RADICAL TREATMENT OF LACRIMO-NASAL DISEASE BY RAPID DILATATION AND ALLIED MEASURES.

S. Lewis Ziegler (*Jr. A. M. A.*, June 18, 1910) discusses the anatomic considerations, the physiologic desiderata and the pathological factors of lacrimo-nasal disease and describes his lacrimal dilator and method of rapid dilatation. Among the minor accidents which may occur during or after this operation he mentions a small rupture of the punctum; some ecchymosis or even swelling of the lower lid; nose bleed from slight scratch of the nasal mucosa by point of the dilator; palpebral emphysema if patient blows his nose during the next twenty-four hours after the operation; infiltration of the tissues with the solution used for irrigation if this method of treatment is employed within one week after operation; a possible slight fracture of the bony walls of the duct. These are usually of slight significance as they rapidly disappear. He has never seen a false passage made during this operation but thinks it might be made by a careless or unskilful operator. The post-operative treatment he briefly describes as follows: "The after-treatment is usually very simple, consisting of a soothing eyewash, to which epinephrin may be added in the proportion of 1 to 16. If the eyelids are glued together for a few days following the operation an astringent application will promptly check the conjunctival discharge. If there should be any puffing of the lids ice-pads may be applied. If there is ecchymosis hot stupes are indicated. If emphysema occurs no treatment is necessary, as it will promptly and spon-

taneously disappear." The operation is indicated in those cases of epiphora and obstruction arising from atresia, localized stricture and general stenosis with interstitial thickening of the mucosa; in ulcerative lesions of the cornea, particularly of the recurrent and phlyctenular types; in cases of wound infection (due to lacrimal disease) following operation or injury; in cases of chronic conjunctivitis, blepharitis marginalis and eczema of the lid caused by irritating lacrimal secretion; in cases of ectropion and entropion of mild degree resulting from lacrimal irritation; in contraction of the socket with an irritating discharge; as a preventative of secondary disturbance from the accumulation of irritating discharge in the socket following enucleation; and in the treatment of trachoma to relieve corneal maceration and pannus. As allied measures he discusses irrigation, incision, stricturotomy and the insertion of styles or medicated bougies. He insists that the nasal origin of tear duct disease must not be lost sight of and that treatment of this cause should be applied and temporary disinfection of the nostril should be used in all cases in which direct ocular infection is suspected. In conclusion he says:

"Rapid dilatation of the lacrimonasal duct is by no means a panacea, but if used with judgment and discretion will undoubtedly prove a most valuable addition to our treatment of tear-duct disease. Its value lies in the rapidity of the dilatation, the avoidance of repetition in probing, and the retention of the capillarity of the duct. In some cases, however, the capillarity must be sacrificed, and in a very few cases it will be necessary to repeat the dilation. In cases of periostitis or caries a second dilatation may be necessary, after the lining of the duct has healed. Stretching is likewise repeated in cases in which a prolonged course of nasal treatment has been instituted and completed. These cases of repetition probably constitute 1 per cent. of all cases treated. I abandoned the use of lacrimal probes nearly twenty years ago and have since relied almost exclusively on rapid dilatation of the tear-duct in order to secure the permanent patulous lumen which the radical treatment of lacrimal disease demands."

METASTATIC GONORRHOEAL CONJUNCTIVITIS WITH REPORT OF A CASE.

Wm. Zentmayer (*Penn. Med. Jr.*, April, 1910) reports a case of metastatic gonorrhoeal conjunctivitis and from his study of the

subject offers the following conclusions which he believes are warranted:

1. That metastatic gonorrhœal conjunctivitis is of more frequent occurrence than is at present recognized.

2. That in cases of bilateral catarrhal conjunctivitis rebellious to treatment, inquiry should be made as to the existence of, or recent recovery from, a specific urethritis.

3. That in such cases when a specific urethritis is present, but all pathogenic organisms are absent from the conjunctival discharge, it is probable that the case is one of metastatic conjunctivitis.

4. That where a patient who has a specific urethritis develops a severe conjunctivitis simultaneously involving both eyes, even though gonococci are present in the conjunctival discharge, the case is probably one of metastatic gonorrhœal conjunctivitis.

THE DIMINUTION OF THE GROWTH OF THE EYE AFTER IRIDECTOMY IN EARLY CHILDHOOD.

Schomburg (*Muenchener Med. Wochenschrift*, May 10, 1910) has made very careful measurements of the eyes of two children upon whose eyes operations had been performed in infancy and found that the development of the eyes in both of these cases had been practically normal. This would tend to refute Wessely's statement, based on experiments on animals, that an iridectomy in infancy tended to check the development of the eye.

BOOK REVIEWS.

DIE COPULATION DER NETZHAUT MIT DER ADERHAUT DURCH KONTAKTVERBINDUNG ZWISCHEN SINNESEPITHEL UND PIGMENTEPITHEL. (The copulation of the retina with the chòroid through contact union between the visual epithelium and the pigment epithelium.) By Dr. R. Halden. Berlin. 1910. S. Karger.

In this most interesting monograph the author tries to prove that in life the retina is firmly attached to the choroid, not only by the usually mentioned union at the ora serrata and the optic nerve entrance, but by the interlacing of the outer segments of the rods and cones and the protoplasmic processes of the pigmented cells, over its whole surface. His arguments seem the more convincing to the reviewer, since he has held a similar opinion for some time and come to it by a very similar reasoning as has the author.

In giving the summing up remarks in the author's own words the reviewer wants to draw special attention to the original therapeutic measures which the author has applied in detachments of the retina. Here is what he says:

"1. The tension of the vitreous body and the attachment of the retina at the ora serrata and at the optic nerve entrance are not the only explanation of the physiologic position of the retina in contact with the choroid.

2. There must be a force which is not identical with the tension of the vitreous body which fastens the retina throughout to its support, the pigment epithelium.

3. This force must be sought in the intimate interlacing (contact-union, copulation) of the visual and the pigment epithelium.

4. In the unperforated globe a detachment of the retina can occur only by a primary damage to the rods and cones or the pigment epithelium by which the contact-union (copulation) of these two layers has been loosened or destroyed. This point has been neglected in all previous detachment-theories.

5. Both anatomy and physiology of the eye have hitherto seen in the rods and cones only cells endowed with optico-sensory and in the pigmented epithelial cells only cells endowed with nutritive and isolating functions. To both of these layers we must in addition vindicate another important mechanical function, that of attaching the retina to the choroid."

As to his operation to cure detachment the author says: "The

operation consisted of perforating with a Knapp's knife-needle the sclerotic and choroid like a sieve, while leaving the retina intact, in the whole extent of the detachment by numerous short stabs and cuts. Then by applying over the whole area an especially devised suction apparatus the retroretinal fluid could be removed and the retina be brought close to the choroid. Moreover, by the application of this suction apparatus which was several times repeated on the following days, a decided and long continued hyperæmia was procured in the diseased parts of the retina and choroid. I was led to this by the thought that in this way it might be possible to reform an intimate contact between the copulation layers and then to increase to the utmost possible the firmness of this union by influencing beneficially the nutrition and the reduced turgescence of the rods and cones and the pigment epithelium by this hyperæmia. Furthermore, at the sites of the numerous small perforations delicate cicatricial attachments might result without gross injury to the retina as must follow its direct cutting. In a very desperate case which, after everything had been tried, had been given up as hopeless by a renowned ophthalmologist, I succeeded in reaching a remarkable result. Vision was raised from counting fingers close to the eye to 1/7."

PRACTICAL MEDICINE SERIES. Volume III. THE EYE, EAR, NOSE AND THROAT. Edited by C. A. Wood, A. H. Andrews and G. P. Head. Series 1910. Chicago. The Year Book Publishers. Price \$1.50 (\$10 for the series of 10 volumes).

This volume is one of ten covering the whole field of medicine and surgery for the year prior to their being issued. We are of course, especially interested in the chapter on the eye by C. A. Wood. In this are recorded with completeness the advances made in our knowledge of the eye, its diseases and their treatment. As a reference book it will be of great help to the student and author.

The same can conscientiously be said about the other parts of this volume.

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